CLAIMS

1. An electrodeless discharge lamp lighting device, comprising:

a DC/AC conversion circuit that converts DC power into high frequency power in response to a drive signal with a drive frequency, said high frequency power having an operating frequency corresponding to the drive frequency;

a resonance circuit that has a resonance characteristic and receives said high frequency power to provide high frequency power varying in response to said operating frequency based on the resonance characteristic, said resonance characteristic being a characteristic in which a first resonance curve with a resonance peak at a prescribed resonance frequency in a start mode is shifted to a second resonance curve lower than the first resonance curve in a lighting mode, said start mode being a mode before an electrodeless discharge lamp lights, said lighting mode being a mode while the electrodeless discharge lamp is lighting;

an induction coil that: generates high frequency electromagnetic field in response to the high frequency power provided through said resonance circuit; and induces high frequency power to said electrodeless discharge lamp by applying the high frequency electromagnetic field to said electrodeless discharge lamp;

a voltage detection circuit that detects a voltage applied to said induction coil by the high frequency power from said resonance circuit and then provides a detection voltage;

a drive circuit that provides said DC/AC conversion circuit with said drive signal having the drive frequency while adjusting the drive frequency

in response to variable power; and

a start circuit that, when said electrodeless discharge lamp is started, sweeps down or up said variable power so as to sweep said detection voltage while sweeping down said operating frequency from a prescribed start frequency higher than said resonance frequency to a prescribed end frequency lower than the start frequency;

wherein said electrodeless discharge lamp lighting device further comprises:

a current detection circuit that detects a current flowing through said resonance circuit to provide a detection current;

a control circuit that increases or decreases said variable power so that said detection current comes to equal a prescribed current for shifting said operating frequency to a middle range frequency between said start frequency and said end frequency, said prescribed current being set so that said detection voltage in case of the middle range frequency becomes lower than that in case of the end frequency; and

a suppression means that starts suppression of said control circuit's operation when said electrodeless discharge lamp is started, and then holds the suppression during at least said start mode.

2. The electrodeless discharge lamp lighting device of claim 1, wherein:

said drive circuit adjusts said drive frequency in response to increase or decrease of a current of said variable power;

said starting circuit sweeps down or up the current of said variable

power so as to sweep said detection voltage while sweeping down said operating frequency from said start frequency to said end frequency;

said control circuit comprises an error amplification circuit that increases or decreases the current of said variable power so that said detection current comes to equal said prescribed current; and

said suppression means brings said current from said error amplification circuit to said drive circuit to zero or a prescribed level during at least said start mode.

3. The electrodeless discharge lamp lighting device of claim 2, wherein:

said error amplification circuit comprises an operational amplifier with a non-inverting input terminal, an inverting input terminal and an output terminal, wherein the operational amplifier receives a reference voltage equivalent to said prescribed current and a detection voltage equivalent to said detection current at the input terminals, and then increases or decreases the current of said variable power so that the detection voltage equivalent to the detection current comes to equal the reference voltage; and

said suppression means constitutes an integration circuit that is connected between one input terminal of said input terminals and said output terminal, said integration circuit having a time constant that is set to a value greater than a value equivalent to a period of time of at least said start mode.

4. The electrodeless discharge lamp lighting device of claim 2, wherein:

said error amplification circuit comprises an operational amplifier with a non-inverting input terminal, an inverting input terminal and an output terminal, wherein the operational amplifier receives a reference voltage equivalent to said prescribed current and a detection voltage equivalent to said detection current at the input terminals, and then increases the current of said variable power so that the detection voltage equivalent to said detection current comes to equal the reference voltage after said suppression means releases said suppression; and

said suppression means adjusts said reference voltage so that an output current of said operational amplifier substantially comes to equal zero during at least said start mode.

5. The electrodeless discharge lamp lighting device of claim 2, wherein said drive circuit is substantially controlled with only said control circuit after said operating frequency reaches said end frequency.

6. The electrodeless discharge lamp lighting device of claim 2, wherein said end frequency is set to a frequency in proximity to a peak of said second resonance curve.

7. The electrodeless discharge lamp lighting device of claim 2, wherein said starting circuit comprises:

a sweep circuit that provides a sweep voltage sweeping up or down

from a point in time at which said electrodeless discharge lamp is started; and

an operational amplifier with a non-inverting input terminal, an inverting input terminal and an output terminal, wherein the operational amplifier receives said detection voltage from said voltage detecting circuit and said sweep voltage at the input terminals, and then decreases or increases the current of said variable power so that the detection voltage comes to equal the sweep voltage.

8. A luminaire, comprising the electrodeless discharge lamp lighting device and the electrodeless discharge lamp of claim 1.